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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/809,392	03/26/2004	Chang-Hun Lee	YOM-0297	7554

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EXAMINER	
SCHECHTER, ANDREW M	
ART UNIT	**PAPER NUMBER**
2871	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/18/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/809,392	LEE ET AL.	
	Examiner	Art Unit	
	Andrew Schechter	2871	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 November 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4,6 and 8-10* is/are pending in the application.

4a) Of the above claim(s) *3 and 10* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4,6,8 and 9* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *24 April 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Request for Continued Examination

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 7 November 2007 has been entered.

Response to Arguments

2. Applicant's arguments filed 7 November 2007 have been fully considered but they are not persuasive.

The applicant argues [p. 7] that *Suzuki* and *Mori* do not disclose the pixel and common electrodes being curved and the pitch being larger than about 50 μm. This is irrelevant. *Ono* is relied on to teach the electrodes being curved, and the pitch of the curvature in the combined device is determined with reference to both the *Ono* and *Suzuki* references.

The applicant disagrees [p. 8] with the examiner's statement that the pitch of the curving of the electrodes in *Suzuki* (and *Mori*) in view of *Ono* would be larger than about 50 μm. This is not persuasive. The applicant states that *Suzuki* discloses a size of one pixel is 110μm x 330 μm; the examiner agrees. The applicant states *Suzuki*'s pixel in

Fig. 9 is divided into four sub-pixels (SP1-SP4); the examiner agrees. The applicant argues that "the pitch of a curved electrode in no way relates to one pixel area of *Suzuki*"; the examiner does not agree. The term pitch is not explicitly defined in the specification, but the examiner assumes that the normal definition is meant: the pitch is the distance between equivalent points in the curve; for instance in Fig. 6, starting at the top of the figure, each electrode curves to the right and then returns to the left; the equivalent points are at the top and bottom of the pixel, so the pitch is the length labeled "P" in the figure. Just as in *Ono*, the pitch is the vertical length of the pixel. In *Suzuki,* the four sub-pixels each have the same vertical length, which is also the vertical length of the pixel itself, so when *Suzuki* is modified by *Ono's* teaching to have curved electrodes, the pitch would also have to be the vertical length of the pixel. As the applicant admits, this is longer than about 50 μm.

The applicant argues [pp. 8-9] that *Suzuki* discloses that the common electrode is 15 μm in pitch, so *Suzuki* discloses "a pitch of electrodes" less than 50 μm. This is not at all persuasive. *Suzuki*'s pitch and the recited pitch are clearly two different things. *Suzuki's* 15 μm pitch is the horizontal distance between two electrodes. The recited pitch is the pitch of the curving of an electrode, which in both the present invention and in *Ono* is the vertical length of the pixel.

The previous rejections are therefore maintained, with the same grounds and art.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1, 2, 4, 6, 8, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Suzuki et al.,* U.S. Patent No. 5,905,556 in view of *Mori et al.,* U.S. Patent No. 5,367,179, and further in view of *Ono et al.,* U.S. Patent No. 6,774,956.

Suzuki discloses [see Figs. 20 and 21, for instance] a liquid crystal display comprising first and second substrates [1 and 5], a common electrode [CE] on the first substrate connected to a common electrode line [at top, say], making an obtuse angle; a pixel electrode [S] formed on the first substrate and alternately arranged with the common electrode, connected to a pixel electrode line [at top, say], making an obtuse angle; and a liquid crystal layer [M] interposed between the substrates, wherein a first edge of the common electrode line [the slanted portion] makes an obtuse angle relative to an initial molecular director [ϕ_{LC}, the direction of M, given as an angle from a vector going to the right horizontally] and a first edge of the pixel electrode line [the slanted portion] makes and obtuse angle relative to the initial molecular director [the slant of the electrodes is given by ϕ_A, and the condition that the angles are obtuse is mathematically equivalent to the condition $\phi_A < \phi_{LC} - 90°$ given as equation (5) in col. 8; note that ϕ_A is a negative number when the slanted portions are oriented as in Figs. 20 and 21].

Suzuki does not disclose (at least as interpreted above) a source electrode. *Mori*

discloses [see Fig. 3, for instance] an analogous LCD where the data lines have source electrodes [17a] protruding from them to extend over the semiconductor layer [14]. It would have been obvious to one of ordinary skill in the art at the time of the invention to have such source electrodes in the device of *Suzuki*, motivated by the desire to reduce the possibility of breaking the data lines as they go over each semiconductor element; with the source electrodes, a breakage at the semiconductor bump would only affect at most a single pixel (and possibly not even that), instead of an entire column of pixels.

Suzuki does not disclose that the pixel electrode and common electrode are curved, with a pitch of the curving of the pixel electrode and common electrode being larger than about 50 microns. *Ono* does disclose [see Fig. 1] an analogous device in which the pixel electrode and common electrode are curved. It would have been obvious to one of ordinary skill in the art at the time of the invention to use this shape for the electrodes in *Suzuki*, motivated by *Ono's* teaching that electrodes in this shape produce a multi-domain-type device [col. 8, lines 31-32], which produces improved viewing angle properties. The pitch of the curving of the electrodes, in *Ono* as in the present invention, is the vertical length of the pixel region; *Suzuki* discloses its pixel region as being 110 μm by 330 μm, so the pitch of the curving of the electrodes in the device of *Suzuki* in view of *Ono* would be larger than about 50 μm.

Claim 1 is therefore unpatentable.

There are alignment films [4, 6] which are rubbed [col. 6, lines 10ff.] giving the initial molecular director direction, so claim 8 is also unpatentable.

The initial molecular director makes a clockwise acute angle relative to the common electrode and the pixel electrode [see Fig. 20, equation (1)], and makes counterclockwise obtuse angles with the first edges of the common electrode line and the pixel electrode line [obtuse as discussed above, and the direction is clearly counterclockwise], so claims 2 and 9 are also unpatentable. A second edge [the top] of the common electrode line extends substantially perpendicular to the common electrode, and a second edge [the top] of the pixel electrode line extends substantially perpendicular to the pixel electrode, so claim 4 is also unpatentable. The curved pixel and common electrodes in the device of *Suzuki* in view of *Ono* would be oblique to the second edges of the pixel and common electrode lines, so claim 6 is also unpatentable.

Election/Restrictions

5. Claims 3 and 10 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim. Election was made without traverse in the reply filed on 13 January 2006.

Conclusion

6. All claims are drawn to the same invention claimed in the application prior to the entry of the submission under 37 CFR 1.114 and could have been finally rejected on the grounds and art of record in the next Office action if they had been entered in the application prior to entry under 37 CFR 1.114. Accordingly, **THIS ACTION IS MADE FINAL** even though it is a first action after the filing of a request for continued

examination and the submission under 37 CFR 1.114. See MPEP § 706.07(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew Schechter whose telephone number is (571) 272-2302. The examiner can normally be reached on Monday - Friday, 9:00 - 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms can be reached on (571) 272-1787. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Andrew Schechter
Primary Examiner
Technology Center 2800
10 January 2007